

REMARKS

Claims 1 through 23 are pending in this Application, of which claims 13 through 20 stand withdrawn from consideration pursuant to the provisions of 37 C.F.R. § 1.142(b). Claims 6 through 12 have been allowed. Accordingly, the only remaining issue pivots about the patentability of claims 1 through 5 and 21 through 23, claim 1 being the only independent claim.

Claims 1, 2, 5, 21 and 22 were rejected under 35 U.S.C. § 102 for lack of novelty as evidenced by Huang et al.

This rejection is traversed.

Applicants again stress the factual determination of lack of novelty under 35 U.S.C. § 102 requires the **identical** disclosure in a single reference of each element of a claimed invention such that the **identically claimed invention** is placed into the recognized possession of one having ordinary skill in the art. *Dayco Prods., Inc. v. Total Containment, Inc.*, 329 F.3d 1358, 66 USPQ2d 1801 (Fed. Cir. 2003); *Crown Operations International Ltd. v. Solutia Inc.*, 289 F.3d 1367, 62 USPQ2d 1917 (Fed. Cir. 2002). There are now at least two fundamental differences between the claimed method and the methodology of Huang et al. that scotch the factual determination that Huang et al. disclose a method identically corresponding to that claimed.

The Examiner's new ground of rejection.

In the previous Office Action dated October 26, 2005, the Examiner also referred to Fig. 1 of Huang et al., but identified single first dielectric layer 20 as the first dielectric layer, which

is a more accurate description of Huang et al. than that now offered. In response to the previous rejection, Applicants argued that what the Examiner called the first barrier layer 40 of silicon oxide is not formed on the single first dielectric layer 20 with an interface therebetween, because of the presence of an intervening layer 30.

Now the Examiner completely rewires the rejection and asserts that the first dielectric layer in the Fig. 1 embodiment of Huang et al. is layer 30, which is silicon carbide or silicon oxynitride. The Examiner then states that the first barrier layer 40, which is silicon oxide, is formed on the first dielectric layer 30 with an interface therebetween as shown in Fig. 1.

Actually, the Examiner's rejection not only rewires the previous rejection but completely restructures what Huang et al. disclose as their invention. Moreover, the Examiner's interpretation of the claimed invention is legally erroneous.

Specifically, in accordance with the present invention, as recited in independent claim 1, a first dielectric **barrier** layer is formed on a single dielectric layer with an interface therebetween. The **barrier** layer, as one having ordinary skill in the art would have understood even without the benefit of the present disclosure but, particularly when interpreted in light of and consistent with the written description of the specification which is the judicially standard, is a material that prevents copper diffusion through dielectric material such as silicon dioxide. See, for example, page 2 of the written description of the specification, and the first full paragraph and page 4 thereof, lines 15 through 29. Dielectric barrier layers in accordance with the present invention are exemplified by silicon nitride, silicon carbide or silicon oxynitride. Layer 30 of the Fig. 1 device of Huang et al., which the Examiner says is the first dielectric layer, is characterized as "a first etch-stop or protective **barrier** layer 30 overlying low-K layer 20" (column 4 of Huang et al., lines 32 and 33, emphasis supplied). Layer 30 is exemplified by

silicon nitride, silicon oxynitride or silicon carbide. So what Huang et al. call the first barrier layer, the Examiner converts to a dielectric layer. The Examiner says that layer 40 is the barrier layer. But Huang et al. say that layer 40 is a “first standard-K layer 40 overlying first low-K layer 20 and first barrier layer 30” (column 4 of Huang et al., lines 59 through 60). Layer 40 is exemplified by silicon oxide. Silicon oxide is not a barrier material with respect to silicon oxynitride, silicon carbide or silicon nitride, as one having ordinary skill in the art would have understood. Accordingly, the Examiner’s interpretation of the barrier layer of the claimed invention as corresponding to layer 40 of Huang et al. is not the way one having ordinary skill in the art would have interpreted the barrier layer of the claimed invention with respect to the teachings of Huang et al. in the **context** of the disclosed invention. *Philips v. AWH Corp*; 415 F.3d 1302 (Fed. Cir. 2005) (*en banc*).

There is another fundamental difference between the claimed method and the methodology of Huang et al. Specifically, in accordance with the method defined in independent claim 1, after depositing the first barrier layer, etching is conducted to form a **single opening entirely within and defined by side surfaces of the single first dielectric layer**. The opening 54 illustrated in Fig. 2 of Huang et al., which results from etching the relied upon Fig. 1 of Huang et al., is **not**, repeat **not**, “entirely within and defined by side surfaces of the single first dielectric layer (30 according to the Examiner). Rather, it should be apparent that the opening is defined by not only the first dielectric layer 30 but also second dielectric layer 40 as well as intermediate layer 30.

Based upon the foregoing, it should be apparent that, as a factual matter, Huang et al. neither disclose nor suggest a process as defined in independent claim 1 requiring the manipulative steps of forming a first barrier layer on a single first dielectric layer with an interface therebetween, and then etching to form a single opening entirely within and defined by side surfaces of the single first dielectric layer.

The above argued differences in manipulative steps between the claimed method and the methodology of Huang et al. undermine the factual determination that Huang et al. disclose a method identically corresponding to that claimed. *Minnesota Mining & Manufacturing Co. v. Johnson & Johnson Orthopaedics Inc.*, 976 F.2d 1559, 24 USPQ2d 1321 (Fed. Cir. 1992); *Kloster Speedsteel AB v. Crucible Inc.*, 793 F.2d 1565, 230 USPQ 81 (Fed. Cir. 1986). Applicants, therefore, submit that the imposed rejection of claims 1, 2, 5, 21 and 22 under 35 U.S.C. § 102 for lack of novelty as evidenced by Huang et al. is not factually or legally viable and, hence, solicit withdrawal thereof.

Claims 2 through 4 and 23 were rejected under 35 U.S.C. § 103 for obviousness predicated upon Huang et al. in view of Hasegawa et al.

This rejection is traversed. Specifically, claims 2 through 4 and 23 depend from independent claim 1. Applicants incorporate herein the arguments previously advanced in traversing the imposed rejection of claim 1 under 35 U.S.C. § 102 for lack of novelty as evidenced by Huang et al. The secondary reference to Hasegawa et al. does not cure the previously argued deficiencies of Huang et al. Accordingly, even if the applied references are combined as suggested by the Examiner, and Applicants do **not** agree that the requisite fact-

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based motivation has been established, the claimed invention would **not** result. *Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 5 USPQ2d 1434 (Fed. Cir. 1988).

Applicants, therefore, submit that the imposed rejection of claims 2 through 4 and 23 under 35 U.S.C. § 103 for obviousness predicated upon Huang et al. in view of Hasegawa et al. is not factually or legally viable and, hence, solicit withdrawal thereof.

Applicants acknowledge, with appreciation, the Examiner's allowance of claims 6 through 12. Based upon the arguments submitted *supra*, it should be apparent that the imposed rejections have been overcome and that all active claims are in condition for immediate allowance. Favorable consideration is, therefore, solicited.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

McDERMOTT WILL & EMERY LLP



Arthur J. Steiner
Registration No. 26,106

600 13th Street, N.W.
Washington, DC 20005-3096
Phone: 202.756.8000 AJS:bjs:ntb
Facsimile: 202.756.8087
Date:

**Please recognize our Customer No. 20277
as our correspondence address.**